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CLAIM AMENDMENTS

1. (CURRENTLY AMENDED) A method of producing a nanoporous silica dielectric film comprising
(a) preparing a composition comprising a silicon containing pre-polymer, a porogen, and a metal-ion-free catalyst selected from the group consisting of ~~onium compounds and nucleophiles~~ tetramethylammonium acetate, tetrabutylammonium acetate, tetramethylphosphonium acetate, tetramethylphosphonium hydroxide, triphenylphosphine, trimethylphosphine, trioctylphosphine, and combinations thereof;
(b) coating a substrate with the composition to form a film,
(c) crosslinking the composition to produce a gelled film, and
(d) heating the gelled film at a temperature and for a duration effective to remove substantially all of said porogen.

2. (ORIGINAL) The method of claim 1 wherein the nanoporous silica dielectric film has a pore void volume of from about 5% to about 80% based on the volume of the film.

3. (ORIGINAL) The method of claim 1 wherein the resulting nanoporous silica dielectric film has a dielectric constant of about 3 or below.

4. (ORIGINAL) The method of claim 1 wherein the nanoporous silica dielectric film has an average pore diameter in the range of from about 1 nm to about 30 nm.

5. (CANCELED)

6. (CANCELED)

7. (CANCELED)

8. (ORIGINAL) The method of claim 1 wherein the composition further comprises a non-metallic, nucleophilic additive which accelcrates the crosslinking of the composition.

9. (ORIGINAL) The method of claim 1 wherein the composition further comprises a nucleophilic additive which accelerates the crosslinking of the composition, which is selected from the group consisting of dimethyl sulfone, dimethyl formamide, hexamethylphosphorous triamide, amines and combinations thereof.

10. (ORIGINAL) The method of claim 1wherein the composition further comprises water in a molar ratio of water to Si ranging from about 0.1:1 to about 50:1.

11. (CURRENTLY AMENDED) The method of claim 1 wherein the composition comprises a silicon containing ~~prepolymer~~ pre-polymer of Formula I:

$$Rx - Si - Ly \qquad \text{(Formula I)}$$

wherein x is an integer ranging from 0 to about 2, and y is x-4, an integer ranging from about 2 to about 4;
R is independently selected from the group consisting of alkyl, aryl, hydrogen, alkylene, arylene, and combinations thereof;
L is an electronegative moiety, independently selected from the group consisting of alkoxy, carboxyl, acetoxy, amino, amido, halide, isocyanato and combinations thereof.

12. (CURRENTLY AMENDED) The method of claim 11 wherein the composition comprises a polymer formed by condensing a ~~prepolymer~~ pre-polymer according to Formula I, wherein the number average molecular weight of said polymer ranges from about 150 to about 300,000 amu.

13. (ORIGINAL) The method of claim 1 wherein the composition comprises a silicon containing pre-polymer selected from the group consisting of an acetoxysilane, an ethoxysilane, a methoxysilane, and combinations thereof.

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14. (ORIGINAL) The method of claim 1 wherein the composition comprises a silicon containing pre-polymer selected from the group consisting of tetraacetoxysilane, a C_1 to about C_6 alkyl or aryl-triacetoxysilane, and combinations thereof.

15. (ORIGINAL) The method of claim 14 wherein said triacetoxysilane is methyltriacetoxysilane.

16. (ORIGINAL) The method of claim 1 wherein the composition comprises a silicon containing pre-polymer selected from the group consisting of tetrakis(2,2,2-trifluoroethoxy)silane, tetrakis(trifluoroacetoxy)silane, tetraisocyanatosilane, tris(2,2,2-trifluoroethoxy)methylsilane, tris(trifluoroacetoxy)methylsilane, methyltriisocyanatosilane and combinations thereof.

17. (ORIGINAL) The method of claim 1 wherein the porogen has a boiling point, sublimation point or decomposition temperature ranging from about 150°C to about 450°C.

18. (CURRENTLY AMENDED) The method of claim 1 wherein ~~the~~ step (c) comprises a crosslinking which is conducted at a temperature which is less than the heating temperature of step (d).

19. (ORIGINAL) The method of claim 1 wherein step (c) comprises heating the film at a temperature ranging from about 100 °C to about 250 °C, for a time period ranging from about 30 seconds to about 10 minutes.

20. (ORIGINAL) The method of claim 1 wherein step (d) comprises heating the film at a temperature ranging from about 150 °C to about 450 °C, for a time period ranging from about 30 seconds to about 1 hour.

21. (ORIGINAL) The method of claim 1 wherein the porogen has a molecular weight ranging from about 100 to about 50,000 amu.

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22. (ORIGINAL) The method of claim 1 wherein the porogen is selected from the group consisting of a polyalkylene oxide, a monoether of a polyalkylene oxide, a diether of a polyalkylene oxide, bisether of a polyalkylene oxide, an aliphatic polyester, an acrylic polymer, an acetal polymer, a poly(caprolatactone), a poly(valeractone), a poly(methyl methacrylate), a poly (vinylbutyral) and combinations thereof.

23. (ORIGINAL) The method of claim 1 wherein the porogen comprises a polyalkylene oxide monoether which comprises a C_1 to about C_6 alkyl chain between oxygen atoms and a C_1 to about C_6 alkyl ether moiety, and wherein the alkyl chain is substituted or unsubstituted.

24. (ORIGINAL) The method of claim 23 wherein the polyalkylene oxide monoether is a polyethylene glycol monomethyl ether or polypropylene glycol monobutyl ether.

25. (ORIGINAL) The method of claim 1 wherein the porogen is present in the composition in an amount of from about 1 to about 50 percent by weight of the composition.

26. (ORIGINAL) The method of claim 1 wherein the composition further comprises a solvent.

27. (ORIGINAL) The method of claim 1 wherein the composition further comprises solvent in an amount ranging from about 10 to about 95 percent by weight of the composition.

28. (ORIGINAL) The method of claim 1 wherein the composition further comprises a solvent having a boiling point ranging from about 50 to about 250°C.

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29. (ORIGINAL) The method of claim 1 wherein the composition further comprises a solvent selected from the group consisting of hydrocarbons, esters, ethers, ketones, alcohols, amides and combinations thereof.

30. (ORIGINAL) The method of claim 26 wherein the solvent is selected from the group consisting of di-n-butyl ether, anisole, acetone, 3-pentanone, 2-heptanone, ethyl acetate, n-propyl acetate, n-butyl acetate, ethyl lactate, ethanol, 2-propanol, dimethyl acetamide, propylene glycol methyl ether acetate, and combinations thereof.

31. (CANCELED)

32. (CURRENTLY AMENDED) A semiconductor device comprising a nanoporous dielectric film of claim ~~31~~ 34.

33. (ORIGINAL) The semiconductor device of claim 32 that is an integrated circuit.

34. (CURRENTLY AMENDED) A nanoporous silica dielectric film formed from a composition comprising a silicon containing pre-polymer, a porogen, and a metal-ion-free catalyst selected from the group consisting of ~~onium compounds and nucleophiles~~ tetramethylammonium acetate, tetrabutylammonium acetate, tetramethylphosphonium acetate, tetramethylphosphonium hydroxide, triphenylphosphine, trimethylphosphine, trioctylphosphine, and combinations thereof,
which nanoporous silica dielectric film is produced according to the method of claim 1.

35. (CANCELED)

36. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein the composition additionally ~~comprising~~ comprises a solvent.

37. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim ~~35~~ 34 wherein said metal-ion-free catalyst is tetramethylammonium acetate.

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38. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein said silicon containing pre-polymer comprises a combination of acetoxy-based leaving groups.

39. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 38 wherein said silicon containing pre-polymer comprising a combination of acetoxy-based leaving groups comprises tetraacetoxysilane and methyltriacetoxysilane.

40. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein said porogen comprises polyethylene glycol monomethylether.

41. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein said porogen comprises polypropylene glycol dimethylether.

42. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein said porogen comprises polyethylene glycol dimethylether.

43. (CURRENTLY AMENDED) The ~~composition~~ nanoporous silica dielectric film of claim 34 wherein said porogen comprises polypropylene glycol monobutyl ether.

44. (CURRENTLY AMENDED) A precursor for ~~stable~~ nanoporous silica dielectric film formation comprising said composition of claim ~~35~~ 34.

45. (CURRENTLY AMENDED) A nanoporous silica dielectric film of claim 34 wherein said composition is a spin-on composition ~~comprising said composition of claim 35~~.

46. (CANCELED)

47. (CANCELED)

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